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ANNUAL SUMMARY

PART B

SNOWFALL

CONTENTS

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INDIA WEATHER REVIEW, 1949

ANNUAL SUMMARY.

PART B.

SNOWFALL.

This part contains a summary of the reports of snowfall in the mountain regions to the north of India. These reports are collected by local officers from the local residents, headmen of villages or from travellers who have passed through the region and are then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in feet and inches. At places provided with raingauges the snow collected in the gauge is melted and measured as rain. This is indicated in the text and the measurements are given in inches and cents.

Winter Period, January and February

I.—Kashmir

Skardu and *Dras*—No reports were received.

Srinagar.—There were eight light moderate falls of snow in January and nine in February on the surrounding mountain range of Pir Panjal and in the valley. The depth of each fall on the Pir Panjal varied from a few inches to three feet in January and one to three feet in February. The total precipitation recorded at the central observatory amounted to 2″·29 in January and 5″·29 in February. The heaviest fall (0·40″) in January was recorded on the 25th. In February, the heaviest fall (2″·43) in 24 hours occurred on the 4th. The accumulations on the Pir Panjal range at the end of January and February were six to eight feet and eight to ten feet respectively. The falls were reported to be below normal in January and about normal in February.

Kargil.—No report was received.

Sonamarg.—Snow fell on fourteen days in January and on eight days in February. The depth of the falls varied from one inch to ten inches in January and one inch to seventeen inches in February. The accumulations at the end of January and February were about 5 feet and 11 feet respectively on the ground and 10 feet and 16 feet on the well-known passes of Zojilla and Nichnay. The falls were about the average in January and above the average in February.

Leh.—At the station proper, snow fell on two days in January on the 9th and 16th. On the surrounding hills, except for the periods 9th to 14th and 18th to 25th, there was intermittent snowfall through the month. The snowline at the end of the month was at 14,000 feet. Accumulation was ten feet at a height of about 17,000 feet. The snowfall at the station proper is reported to be less than normal.

II.—The East Punjab

Chamba.—Dalhousie Range (Kalatope)—Snow fell on six days in January to a total depth of 6′ 5½″. The depth of the individual falls varied from ½″ to 3′ 2″. In February, there were 8 snowstorms, the falls amounting to a total depth of about 9 feet. The accumulations of snow at Kalatope were nine inches at the end of January. In the cooler aspects the accumulations were 3½ feet at the end of January and ½ foot at the end of February.

Kangra.—No report was received.

Kilba (*Simla District*).—In January, there were light snowfalls at the higher elevations. The passes were blocked. The first week of February witnessed heavy snowfall from the 2nd to 5th and according to reports such continuous and heavy snowfall had not occurred during the previous 6 years. Falls of snow occurred frequently during the first fortnight. The total falls during the month at Kilba, Sangla and Purbani were 2′ 7″ , 5′ 6″ and 5′ 2½″ respectively. The snowline descended to 5,400 feet (a.s.l.) All the passes were blocked. The fall in January were below normal while in February they were above normal.

III.—United Provinces

Garhwal.—Snow fell on nine days in January and on six days in February. The depth of snow on higher elevations varied from ½′ to 10′ in January and ¼′ to 20′ in February. The falls were above the average during the period.

Almora.—The following table gives the estimated amounts of the falls and accumulation of snow during the two months—

Locality	January	February
	Feet	Feet
Falls		
Malla Danpur	5	7
Malla Johar	½	..
Malla Darma	1	4½
Byans	3 to 4½	5½ to 8½
Accumulations		
Kotela Hill	2½ to 3	12 to 15
Kotela Valley	10 to 15	85 to 100

Locality	January	February
Accumulations	Feet	Feet
Kafini Hill	16 to 20	25 to 30
Kafini Valley	20 to 25	100 to 150
Bankatiya Peak	15 to 20	30 to 40
Bankatiya Valley	20 to 25	..
Pindar Valley	50 to 60	150 to 200
Pindar Peak	200 to 250	200 to 300
Nandakote	35 to 45	50 to 60
Sunderdhunga Valley	30 to 40	120 to 200
Sunderdhunga Peak	20 to 25	100 to 120
Hosling	1	..
Khaliya	½	..
Nubedhura	1	30
Lampiya	4½	8½
Lipu	3	5½

The falls during the period were below normal but the accumulation of snow at the end of the period was slightly above the average.

Multelar.—No report was received for January. Snow fell on two days in the first week of February. The total amount of snow when melted and measured as water amounted to 1·40″. The falls were above the average.

IV.—Assam

Sadiya Frontier Tract.—Snowfall of moderate intensity occurred on one day each in January and February. The depth of the falls varied from ¾″ to 2″. The peaks opposite to Theroliang Camp were covered with snow, the snowline descending to 4,500 feet a. s. l. The snowfall was reported to be above the average.

Baliapara Frontier Tract.—Snowfall was comparatively heavier. The heaviest fall occurred during the first week of February. The depth of snow on the Se-La, Qrkala and Punsum-La was 3′ to 4′. The pass across the Orka-La access to Bhutan was closed from the 1st week of February to the 15th March. The surrounding lower hills (height 6,000 to 7,000 feet) of the Dirang village were also covered with snow for a few days.

Hot Weather Period—March to May

I.—Kashmir

Skardu and *Dras.*—No reports were received.

Srinagar.—During March, six light to moderate falls of snow were observed on the surrounding mountain range of Pir Panjal. The falls were confined to a height of about 7,500 feet a.s.l. The depth of these falls varied from three to five inches. Only one light fall was observed in the valley, which, when melted and measured, amounted to 0·20″. Light to moderate falls of snow were observed on 4 days in April and on seven days in May. The depth of the falls varied from one to six inches in April; in May it did not exceed five inches. The falls were normal in March and April and above normal in May. The snow accumulations on the Pir Panjal range were about 8 to 10 feet at the end of March and April. These were normal. The accumulations at the end of May were reported to be above normal.

Kargil.—No report was received.

Sonamarg.—Snow fell on 14 days in March and on 3 days in April, amounting to total depths of nearly 8 feet and seven inches respectively. On the passes of Zojilla and Nichnay the snowfalls were reported as 10 feet 6 inches and 1 foot 2 inches. The accumulations at the station proper were 11½ feet and 3 feet at the end of each of the two months while those on the Zojilla and Nichnay passes were reported to be about 12 feet and 6 feet respectively. The falls were above normal in March and below normal in April. The accumulations were above normal. No snow fell in May. The accumulations at the end of May on Zojilla and Nichnay passes were about 2 feet and these were normal.

Gurez.—The snowfall in the month of May at Raz-dani pass (Height 11,936 feet) was 10 inches.

Leh.—Snow fell on nine days in March, three days in April and four days in May at the station proper to total depths of 2½″, 1½″ and ¾″ respectively. The snowline at the end of each of the months was at 15,500 feet, 16,000 feet and 16,500 feet a.s.l. respectively. The accumulations on higher elevations were about 10 feet at the end of March and April and about 5 feet at the end of May. The falls were about normal in March and above normal in April and May.

II.—The East Punjab

Chamba.—Dalhousie Range (Kalatope).—Snow fell on 4 days in March to a total depth of 2 feet 8 inches. The snow accumulations at the end of the month were about 1 foot in the cooler portions. Portions exposed to the sun were clear.

One light snowfall occurred in May over the high peaks and passes above 9,000 feet a.s.l. The accumulations of snow on the well-known passes and peaks at the end of May were 6 to 10 feet. These were about the average.

Kangra and *Kilba.*—No report was received.

III. United Provinces

Garhwal.—There were seven falls of snow in March and two each in April and May. The depth of snow on higher elevations was 1″, ½′ and ¼′ to 3′ respectively. The accumulations of snow at the end of May were reported to be above normal.

Almora.—The following table gives the amount of falls during and the accumulations at the end of each of the months.

Locality	March	April	May
	Feet	Feet	Feet
Falls			
Malla Danpur	2	1	1
Malla Darma	1½	1½	1
Malla Johar	..	5	2
Byans	4½ to 7½	7½	5½ to 9½
Chaudans	..	3	..
Accumulations			
Kotela Hill	2 to 3	2½	1
Kotela Valley	10 to 15	6 to 10	5 to 7
Kafini Hill	6 to 10	10	8 to 10
Kafini Valley	30 to 50	20	15 to 20
Bankatiya Peak	15 to 20	10 to 15	8 to 10
Pinder Valley	50 to 60	30 to 40	40 to 50
Pinder Peak	100 to 150	200 to 250	100 to 150
Nandakote	25 to 30	25 to 30	15 to 20
Sunderdhunga Valley	30 to 40	20 to 25	20 to 40
Sunderdhunga Peak	20 to 30	15 to 20	15 to 20
Mashoor Ghati (Nubedhura) ..	25	25	..
Panchuli	35	..	..
Hosling	19½	..	..
Lampiya	7½	..	14
Lipu	4½	..	9

The falls as well as the accumulations were generally about the average during the period.

Monsoon Period—June to September

June and July

I.—KASHMIR

Skardu.—No reports were received.

Dras.—The report received is for a short period *viz.*, 24th July to 31st July. During this period no snow fell either in the adjoining areas or the mountain ranges or passes.

Srinagar.—Three light falls of snow were observed on the surrounding mountain range Pir Panjal in June. The depth of the falls varied from two to four inches. In July, no snowfall was experienced. The falls were above normal in June. The accumulations on the Pir Panjal mountain range were reported to be above normal at the end of June and below normal at the end of the period.

Gulmarg.—There was no snowfall during the period. At the end of July the snow of the preceding winter was visible on the peaks and gorges of the Affarwat and Handibal mountains to a depth of about 1½".

Kargil.—No reports were received.

Sonemarg.—There was no snowfall during the period. The accumulations on the well known peaks and passes of Zojilla and Nichnay were about ½ ft. at the end of July.

Gurez.—The report received gives only the information of snow accumulations up to 26th July as given below :—

Patal Wan—12 inches.

Vigi Galli—Nil.

Pilel Top—12 inches.

Burzal Top—1½ feet.

Leh.—A light snowfall was observed on one day in June at elevation (14,000 feet a.s.l.). The accumulations at the end of June were reported to be about 6" to 1 feet. at 17,500 feet height.

Banihal.—No snowfall was observed at the station or its environments during the period.

II.—THE EAST PUNJAB

Chamba.—Some light falls of snow occurred on high hills above 12,000 feet. The accumulations of snow on the well-known peaks and passes were reported to be normal.

Kangra.—In Kulu sub-division, towards the end of July snowfall occurred on the peaks of Hampta and Rohtang to a total depth of 1 feet and ¾ feet respectively.

Kilba.—No report was received.

III.—UNITED PROVINCES

Garhwal.—In June, snow fell on two occasions to a depth of 1 inch to 6 inches on the higher elevations. In July there was no snowfall. The falls were about the average.

Almora.—The following table gives the aggregate falls during and the accumulations at the end of June and July on the well-known passes and peaks. Both the falls and accumulations were below normal.

Locality	June	July
	Feet	Feet
Falls		
Malla Danpur	½	1
Malla Darma	½	1
Malla Johar	1	1
Byans	4 to 7½	10 to 15
Accumulations		
Kotela Hills	..	..
Kotela Valley	5 to 10	1 to 2
Kafini Hill	10 to 12	5 to 10
Kafini Valley	15 to 20	10 to 15
Bankatiya Peak	5 to 10	10 to 15
Pinder Valley	30 to 50	15 to 30
Pinder Peak	100 to 150	100 to 150

Locality	June	July
	Feet	Feet
Accumulations		
Nandakhat	15 to 20	10 to 15
Sunderdhunga Valley	20 to 30	15 to 20
Sunderdhunga Peak	10 to 15	10 to 15
Nubedhura	21	21
Lampiya	14½	20
Lipu	7½	14

August-September

I.—KASHMIR

Skardu.—No reports were received.

Dras.—In August, there was no snowfall at the station proper but there were three moderate falls of snow confined generally to the mountain peaks of Kawabal, Wazulbal and within the Chhuskim Nalla. The depth of each fall did not exceed 4 inches. In September three light snowfalls extending to the bottom of the surrounding hills and mountain ranges occurred. The depth of the first two falls did not exceed three inches while that of the third fall was between 9 and 13 inches on higher peaks, dwindling down to 4 to 6 inches at the bottom of surrounding hills. The accumulations at the end of September on the Zojilla, the Moili mountain, the Dumcharoo, the Drakshee and the Gumchai were reported to be about 6 to 8 inches. The falls were normal in August and above normal in September.

Srinagar.—There was no snowfall on the surrounding mountain range of Pir Panjal in August. Three light to moderate falls of snow with depth varying from one to three inches occurred on this range in September. Accumulation on the Pir Panjal range at the end of August was below normal and at the end of September about two to three feet. Snowfall was reported to be below normal in August and normal in September.

Gulmarg.—No fresh fall of snow was observed in the valley or the surrounding mountain ranges during August. In September, snow was observed on the 12th on the Affarwat and Handibal mountain ranges. The depth of the fall varied from one to two inches which melted away. Accumulation on the peaks and gorges of the Affarwat and Handibal mountains was about 1½ inches at the end of September. Snowfall was below normal in August and nearly normal in September.

Kargil.—No reports were received.

Sonamarg.—There was no snowfall during the period. Accumulation at the end of September was about 6 inches on the passes of Zojilla and Nichnay.

Leh.—Snow fell on 3-4 days in each of the two months at elevations over 15,000 feet a.s.l. The snowfall of 4" on the hills on the 25th, August is reported to be abnormally heavy. The snowline was at 20,000 feet a.s.l. at the end of August and at 18,000 feet a.s.l. at the end of September.

The falls were reported to be above normal in August and normal in September.

II.—THE EAST PUNJAB

Chamba.—There was no snowfall during the period.

Kangra and Kilba Hills.—No reports were received.

III.—UNITED PROVINCES

Garhwal.—There was no snowfall in August. In September there were 7 days of snowfall on the higher elevations to depths of two to twelve inches. These amounts were also reported as accumulations at the end of the period.

Almora.—The falls and accumulations of snow in various localities during the two months are given below. The falls were nearly normal and the accumulations above the average.

Locality	August	September
	Feet	Feet
Falls		
Malla Danpur	1/3	1½
Malla Darma	1 1/3	2
Malla Johar	1½	¾
Byans	9½ to 14½	8½ to 12
Accumulations		
Kotela Hill	..	½
Kotela Valley	4	1
Kafini Hill	5 to 10	1 to 1½
Kafini Valley	15 to 20	12 to 20
Bankatiya	5 to 10	10 to 15
Pinder Valley	20 to 30	10 to 25
Pinder Peak	50 to 80	115 to 125
Nandakhat	10 to 20	20 to 25
Sunderdhunga Valley	15 to 25	15 to 20
Sunderdhunga Peak	10 to 15	20 to 30
Lipu	13 to 21	16 to 19

Post Monsoon Period

October to December

I.—KASHMIR

Skardu.—No reports were received.

Dras.—Snow fell at Dras and on the surrounding mountains during all the three months. There were three light moderate falls in October and about twelve in December. November witnessed eight vigorous falls. The accumulations

of snow at the end of each month at the station proper and on the mountains were as given below :—

Locality	October	November	December
Station proper (Dras)	1 feet	..	9 inches
Mountains	5 to 7 ft.	2 to 3½ ft.	1 to 2½ft.

The falls were reported to be above normal in October and November and nearly normal in December.

Srinagar.—Light falls of snow ½ inch to six inches in depth occurred on the surrounding mountain range of Pir Panjal, between the 27th and 29th of October. November also witnessed three light snowfalls not exceeding one inch in depth on the Pir Panjal. In December, four light to moderate falls of snow were observed on the surrounding mountain range of Pir Panjal as well as in the valley. The depth of falls on the Pir Panjal was reported to be two to four feet and that in the valley between ¼″ and ½″. The falls in October and November were reported to be normal and in December below normal. The accumulation at the end of each of the months was nearly normal.

Gulmarg.—No report has been received.

Kargil.—No report has been received for October. In November two light falls of snow occurred at the station proper and on the surrounding mountain ranges and passes. The depth of the falls was 7 inches to 10 inches on the mountains and 1 to 2 inches at the station proper. In December ten moderate falls of snow occurred at the station proper and on the surrounding mountain ranges with depths varying between 1″ and 2½″ and 1 foot and 2½ feet respectively. The falls were reported to be below normal. The accumulation of snow on the mountains was 1 foot to 2½ feet at the end of the period and was nearly normal.

Sonamarg.—Snow fell on three days in October to a total depth of two feet at the station proper and about 6 feet on the well-known peaks and passes of Zojilla and Nichnay. In November snow fell on 4 days, the total depth of the falls being 2′ 6″ at the station and 5 feet on the Zojilla and Nichnay passes. There were eight days of snowfall in December and the total depths of these were 13″ at the station and 1¾ feet on the Zojilla and Nichnay. The snowfall was reported to be above the average in October and below the average in November and December. The accumulation at the end of each of the months is given below :—

Locality	October	November	December
Sonamarg	..	2′ 4″	18″
Zojilla and Nichnay	4 to 5 ft.	4¾ ft.	2 ft.

Gurez.—Two or three falls of snow occurred in each of the months October and November to depths of 8 inches and 3 to 4 inches respectively at station proper. On the surrounding mountains there were three falls of snow in October and four in November to depths of 18″ and 36″ respectively in each of the months. December experienced a few falls of snow two to three inches in depth at the station and several falls on the surrounding mountains and also in the valley descending up to the hills of Razdani, Vaggagalli, Tillel, Halakhaton and Patalwan. The accumulations at the end of the months are given below :—

Locality	October	November	December
Mountains	1½ ft.	3 ft.	3 to 4 ft.
Valley	2 in.	3 to 4 in.	2 to 3 in.

The falls were reported to be above normal in October and below normal in November and December.

Leh.—There was practically no snowfall in October. Snow fell at the station proper on 6 days in November and on 12 days in December to total depths of about four inches in each of the months. The accumulations at the end of the period were about five inches at station and a few feet on passes at 17,500 feet a.s.l. The falls were reported to be about normal in October and above normal in the rest of the period.

Banihal.—Nor report was received for October and November. In December 8 light moderate falls, a few inches to three feet in depth were experienced. The accumulations at the end of December on Budlu, Sunduree and Pir Panjal tops were reported to be two to six feet.

II.—The East Punjab

Chamba.—Dalhousie Range (Kalatope)—No report was received for October and November. During December, snow fell on five days to a total depth of 1 foot 1½ inches. Snowline descended to about 6,500 feet during this month. The falls and the accumulations were below the average.

Kulu (Kangra District).—There was no snowfall in October and November. In December snowfall was confined to heights above 7,000 feet between Kulu and Lahaul and the accumulations at the end of the month on the passes were as given below :—

Pass	Height	Accumulations
	Feet	Feet
Hampta	14,000	5
Rohtang	13,000	4
Chavdarkhani	12,000	2¼

The accumulations were about the average.

Kilba (Simla District).—No reports were received.

III.—United Provinces

Garhwal.—There were four falls of snow during October a few in November and five during December on higher elevations. The depth of the snow varied from 6″ to 2′

in October and ¼′ to 2 feet in November. In December it was 1 foot. These were also reported to be the amount of accumulations at the end of the respective months.

Almora.—No report has been received for October and November. The following table gives the falls during and accumulations at the end of December. Both the falls and accumulations were above normal.

Locality	December
Falls	Feet
Malla Danpur ..	4 to 5
Malla Darma ..	2
Byans ..	5½ to 9½
Chaudans ..	15
Accumulation	
Masoor Peak ..	25
Kotela Hill ..	4 to 5
Kotela Valley ..	10 to 12
Kafini Hill ..	50 to 75
Kafini Valley ..	130 to 150
Pinder Valley ..	250 to 270
Pinder Peak ..	200 to 250
Nandakhat ..	100 to 150
Sunder Dhunga Valley ..	150 to 170
Sunder Dhunga Peak ..	100 to 150
Lampiya ..	17
Mansooria ..	23

IV.—Assam

Sadiya Frontier Tract.—No report was received for October. During the rest of the period no snowfall was noticed upto Theorliang or its adjacent peaks.

Abor Hills.—The report received is for November and December. The falls were confined to the peaks in the Padam country and the range standing as the boundary of the Mishmi and Abor Hills above Sisseri head. The falls were about normal.

Baliapara Frontier Tract.—No report has been received for October. During the period, snowfall was less than in previous years and only about a foot of snow was found on the peaks of the Se La, Orka La, Punsum La and other higher ranges. Manda La, Bompu La and Bomdi La had light falls of snow about a few inches in depth during the last part of December. The falls were much below the average.

Summary

Winter Period, January and February.—Snowfall during the period was about normal in Kashmir and the East Punjab and above normal in the United Provinces and Assam. The accumulations at the end of the period were slightly above the average in the United Provinces.

Hot Weather Period, March to May.—Snowfall was generally about the average. The accumulations were about normal in the East Punjab and slightly above normal in Kashmir and the United Provinces.

Monsoon Period, June and July.—Snowfall was generally normal. The accumulations were normal in the East Punjab and below normal in Kashmir and the United Provinces.

Monsoon Period, August and September.—Snowfall during this period was, as usual, confined to higher elevations. The falls in Kashmir and the United Provinces were nearly normal. The accumulations were reported to be above normal in the United Provinces.

Post Monsoon Period, October to December.—Snowfall was above normal in the United Provinces, slightly below normal in Kashmir and the East Punjab and below normal in Assam. The accumulations were above normal in the United Provinces, normal in Kashmir and slightly below normal in the East Punjab.

N. B.—It is not possible to adopt a single classification of season which will be satisfactory for the whole of India. The classification adopted in this publication is, however, considered as the most satisfactory one and the least open to objection especially from the point of views of rainfall.

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